

Selecting Adequate Exposure Biomarkers of Diisononyl and Diisodecyl Phthalates: Data  
from the 2005–2006 National Health and Nutrition Examination Survey

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SUPPLEMENTAL MATERIAL

Supplemental Material, Table 1. Monoisobutyl phthalate (MNP): geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population, National Health and Nutrition Examination Survey 2005–2006.

	Geometric	Selected percentile						Sample
	mean	(95% confidence interval)						
	(95% conf. limit)	10th	25th	50th	75th	90th	95th	size
Total	*	<LOD <sup>a</sup>	<LOD	<LOD	<LOD	1.10 (.800–1.30)	2.30 (1.50–4.00)	2,548
<b>Age group</b>								
6–11 years	*	<LOD	<LOD	<LOD	<LOD	1.10 (<LOD–1.30)	1.40 (1.30–1.70)	356
12–19 years	*	<LOD	<LOD	<LOD	<LOD	1.40 (<LOD–2.80)	3.50 (1.30–7.90)	702
20–59 years	*	<LOD	<LOD	<LOD	<LOD	1.20 (.800–1.80)	2.60 (1.80–4.80)	1,040
60 years and older	*	<LOD	<LOD	<LOD	<LOD	<LOD	1.20 (<LOD–1.90)	450
<b>Gender</b>								
Males	*	<LOD	<LOD	<LOD	<LOD	1.30 (.900–1.90)	2.60 (2.10–4.10)	1,270
Females	*	<LOD	<LOD	<LOD	<LOD	.900 (<LOD–1.00)	1.70 (1.20–2.80)	1,278
<b>Race/ethnicity</b>								
Non-Hispanic whites	*	<LOD	<LOD	<LOD	<LOD	1.00 (<LOD–1.40)	2.10 (1.20–4.20)	1,038
Mexican Americans	*	<LOD	<LOD	<LOD	<LOD	1.00 (.800–1.30)	2.80 (1.30–5.60)	637
Non-Hispanic blacks	*	<LOD	<LOD	<LOD	<LOD	1.30 (1.00–1.80)	3.70 (2.30–5.60)	678

\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

<sup>a</sup> <LOD means less than the limit of detection (0.8 µg/L for MNP)

Supplemental Material, Table 2. Monoisobutyl phthalate (MNP): geometric mean and selected percentiles of urine concentrations (in µg/g creatinine) for the U.S. population, National Health and Nutrition Examination Survey 2005–2006.

	Geometric	Selected percentile						Sample size
	mean (95% conf. limit)	10th	25th	50th	75th	90th	95th	
Total	*	<LOD <sup>a</sup>	<LOD	<LOD	<LOD	2.08 (1.78–2.48)	3.35 (2.59–3.68)	2,548
<b>Age group</b>								
6–11 years	*	<LOD	<LOD	<LOD	<LOD	1.54 (<LOD–1.90)	1.97 (1.65–3.35)	356
12–19 years	*	<LOD	<LOD	<LOD	<LOD	1.73 (<LOD–2.33)	2.59 (1.93–3.43)	702
20–59 years	*	<LOD	<LOD	<LOD	<LOD	2.28 (1.84–2.85)	3.50 (2.72–4.10)	1,040
60+ years	*	<LOD	<LOD	<LOD	<LOD	<LOD	2.85 (<LOD–4.07)	450
<b>Gender</b>								
Males	*	<LOD	<LOD	<LOD	<LOD	1.63 (1.27–2.28)	2.59 (1.81–3.64)	1,270
Females	*	<LOD	<LOD	<LOD	<LOD	2.38 (<LOD–2.85)	3.49 (3.17–4.07)	1,278
<b>Race/ethnicity</b>								
Non-Hispanic whites	*	<LOD	<LOD	<LOD	<LOD	2.19 (<LOD–2.59)	3.17 (2.59–3.51)	1,038
Mexican Americans	*	<LOD	<LOD	<LOD	<LOD	1.77 (1.43–2.42)	3.17 (2.42–4.07)	637
Non-Hispanic blacks	*	<LOD	<LOD	<LOD	<LOD	1.44 (1.19–1.68)	2.85 (1.84–4.39)	678

\* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

<sup>a</sup> <LOD means less than the limit of detection (0.8 µg/L for MNP) for the uncorrected urine values

Supplemental Material, Table 3. Comparison of multiple regression results with or without socio-demographic covariates.

Log <sub>10</sub> (MCOP)	R <sup>2</sup>	Intercept	Beta for log <sub>10</sub> (creatinine)	Beta for Age	Beta for Income
Adjusted model	0.27	-1.03 (-1.27, -0.80)	0.88 (0.79, 0.97)	6-11 years 0.27 (0.20, 0.35) 12-19 years 0.02 (-0.04, 0.08) 20-59 years 0.006 (-0.05, 0.06) 60+ years ref	<\$20K -0.1 (-0.18, -0.03) \$20-\$45K -0.06 (-0.14, 0.02) >\$45K ref
Unadjusted model	0.24	-0.99 (-1.22, -0.77)	0.86 (0.77, 0.95)		

Log <sub>10</sub> (MCNP)	R <sup>2</sup>	Intercept	Beta for log <sub>10</sub> creatinine	Beta for Age (years)	Beta for Income
Adjusted model	0.30	-1.17 (-1.41, -0.93)	0.82 (0.71, 0.94)	6-11 years 0.24 (0.17, 0.31) 12-19 years -0.05 (-0.14, 0.04) 20-59 years -0.07 (-0.15, 0.01) 60+ years ref	<\$20K -0.09 (-.14, -0.03) \$20-\$45K -0.04 (-0.09, 0.01) >\$45K ref
Unadjusted model	0.26	-1.15 (-1.38, -0.92)	0.79 (0.68, 0.90)		

Supplemental Material, Table 4. Creatinine standardized (in  $\mu\text{g/g}$ ) vs creatinine adjusted (in  $\mu\text{g/L}$ ) geometric mean concentrations of MCNP by socio-demographic groups

Group	Creatinine standardization MCNP adjusted GM (95% CI), in $\mu\text{g/g}$	Creatinine adjustment MCNP LSGM (95% CI), in $\mu\text{g/L}$
Age group (in years)		
6-11	5.03 (4.49-5.63)	5.05 (4.52-5.64)
12-19	2.40 (2.11-2.73)	2.59 (2.25-2.97)
20-59	2.40 (2.17-2.66)	2.47 (2.23-2.73)
60+	2.92 (2.45-3.48)	2.90 (2.45-3.44)
Household income		
low	2.26 (2.02-2.54)	2.35 (2.09-2.64)
medium	2.57 (2.40-2.75)	2.65 (2.48-2.84)
high	2.83 (2.51-3.19)	2.88 (2.58-3.23)